

REMARKS

In response to the Office Action dated March 10, 2011, claim 8 has been amended and claims 17-25 have been added. Adequate descriptive support for the present Amendment should be apparent throughout the originally filed claims and disclosure as, for example, the depicted embodiments and related discussion thereof in the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue. Entry of the present Amendment is respectfully solicited. It is believed that this response places this case in condition for allowance. Hence, prompt favorable reconsideration of this case is solicited.

The objection of claim 8 is believed to be moot in view of the amendment to claim 8 to recast it in independent form.

Claims 1-5, 11 and 13-15 were rejected under 35 U.S.C. § 103(a) as obvious over Yoshida (U.S. Pat. No. 6,340,393, hereinafter “Yoshida”); in view Hasegawa et al. (U.S. Patent App. Pub. No. 2002/0127405, hereinafter “Hasegawa”). Applicants respectfully traverse the rejection.

Dependent claim 8 was rejected under 35 U.S.C. § 103(a) as obvious over Yoshida in view Hasegawa and further in view of Imai et al. (U.S. Pat. No. 5,001,452, hereinafter “Imai”). Applicants respectfully traverse the rejection.

Dependent claim 12 was rejected under 35 U.S.C. § 103(a) as obvious over Yoshida in view Hasegawa and further in view of Shiomi et al. (U.S. Pat. No. 5,252,840, hereinafter “Shiomi”). Applicants respectfully traverse the rejection.

In the Office Action, independent claim 1 was rejected on the basis of the combination of Yoshida and Hasegawa. However, Applicants submit that one of ordinary skill in the art would not have been motivated to combine Yoshida and Hasegawa, as suggested in the Office Action. It is respectfully submitted that that Hasegawa cannot be combined to Yoshida, because the

acceptor "H" of Yoshida cannot be replaced with the "Si" disclosed in Hasegawa. Because an object of Yoshida is clearly different from that of the claimed subject matter, and further Yoshida cannot achieve the object if the acceptor "H" is replaced with "Si".

The acceptor "H" of Yoshida is a material for forming a donor-acceptor compound such as a P-H-P pair in a diamond crystal. See col. 2, lines 62-64. Namely, by forming a donor-acceptor compound in a diamond crystal, electron scattering due to an n-type carrier dopant is decreased, but electron movement is greatly increased. See column 3, lines 12-15. As a result, as can be seen from Table 1, Yoshida can obtain a low-resistance single crystal diamond that does not depend on a substrate temperature, namely has a low temperature dependency of carrier concentration. In other words, the object of Yoshida is to obtain a low-resistance n-type diamond, but not to obtain a diamond having a characteristic of a negative correlation with temperature, as with the present claimed subject matter. That is, Yoshida neither teaches nor suggests obtaining a negative correlation with temperature while "H" and "P" are contained in a diamond. In this manner, it cannot be presumed from Yoshida to achieve a negative correlation with temperature even if employing any p-type dopant instead of "H."

On the other hand, Hasegawa indicates "Si" as an acceptor in the explanation concerning the ion implant experiment, but the Kobayashi reference ("NEW DIAMOND" Vol. 5, No. 4, pp.15, Oct. 1989), submitted with Applicants' previous response filed on June 2, 2009, teaches that a diamond thin film, in which silicon is doped by chemical vapor deposition, may become an n-type semiconductor. Hasegawa does not teach or suggest that "Si" is doped in a diamond together with any element, and that an obtained diamond has a negative correlation with temperature. Conversely, if replacing "H" of Yoshida with "Si" of Hasegawa, a donor-acceptor compound cannot be formed in a diamond crystal because "Si" is a Group 4 element. Instead of

a donor-acceptor compound, a silicon carbide localizes in a diamond crystal. In this case, Yoshida cannot achieve its objective because a temperature dependency of carrier concentration increases, as is the case with the present claimed subject matter. Thus, in view of the foregoing technical explanation, it would not have been obvious to one of ordinary skill in the art to have replaced the "H" acceptor of Yoshida with "Si" of Hasegawa.

Under Federal Circuit guidelines, a dependent claim is allowable if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Thus, as independent claim 1 is allowable for the reasons set forth above, it is respectfully submitted that the remaining dependent claims are allowable for at least the same reasons as the base claim. Moreover, independent claim 8 is patentable for substantially the same reasons as claim 1.

Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call the undersigned attorney at the telephone number shown below.

Application No.: 10/580,346

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP

Brian K. Seidleck
Registration No. 51,321

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BKS:slf
Facsimile: 202.756.8087
Date: July 6, 2011

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